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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/810,452 | 03/26/2004 | Sehat Sutardja | MP0467 | 8949 |
| 26703 | 7590 | 08/10/2005 | EXAMINER | |
| HARNESS, DICKEY & PIERCE P.L.C. 5445 CORPORATE DRIVE SUITE 400 TROY, MI 48098 | | | VU, BAO Q | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2838 | |

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/810,452 | SUTARDJA, SEHAT | |
| | Examiner | Art Unit | |
| | Bao Q. Vu | 2838 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

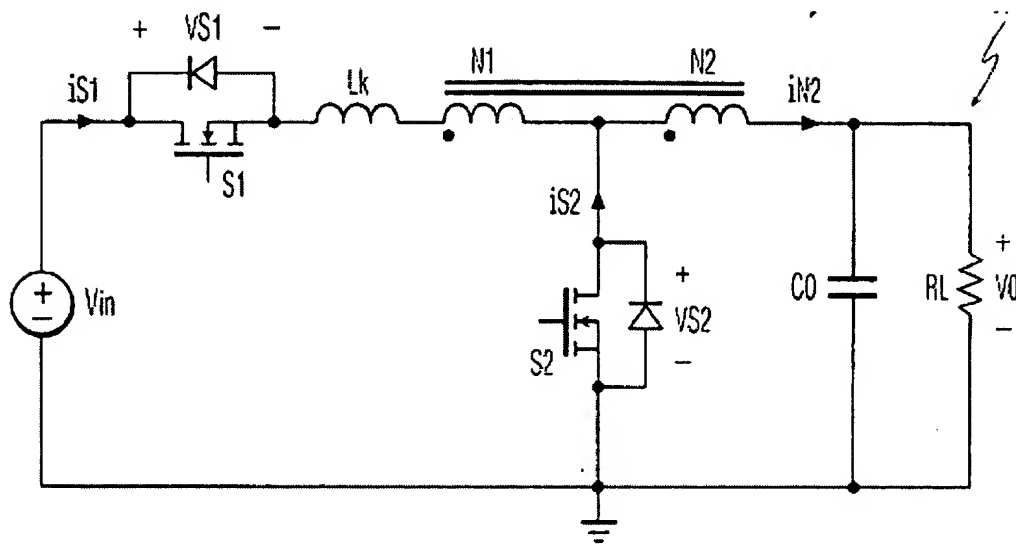
Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in claim the United States.

3. Claims 1, 2, 5, 6, 9, 11, 12, 15, 16, 19, 21 and 23 rejected under 35 U.S.C. 102(b) as being clearly anticipated by Qian (USP 6,512,352). Qian discloses the claimed invention a coupled inductor with first, N1, and second, N2, windings connected in series to form a common node, a conduction switch, S1, and a freewheeling switch, S2, the inductor is formed on a single core, and an output capacitor, Co. See figure below.



Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 4 and 13, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352). Qian discloses the claimed invention except for turn ratios of the inductor devices. It would have been an obvious matter of engineering design choice to have a turns ratio of two, since applicant has not disclosed that a turns ratio of two solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with any other turn ratio configuration.

6. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352) in view of Boeckman et al. (USP 6,184,666). Qian discloses the

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claimed invention except for the independently controlled parallel switches. Boeckman discloses that it is known in the art to provide the independently controlled parallel switches. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide the independently controlled parallel switches of Boeckman with the controlled inductive switching circuit of Qian, in order to reduce the heated generated by either switch when in operation to create a redundancy to handled higher voltages and reduces the failure rate of the switches.

7. Claims 10, 22, 20, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352) in view of Yang et al. (USP 6,404,175). Qian discloses the claimed invention except for the parallel-connected voltage regulators with the phase controller. Yang discloses that it is known in the art to provide the parallel-connected voltage regulators with the phase controller. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to provide the parallel-connected voltage regulators with the phase controller of Yang with the controlled inductive switching circuit of Qian, in order provide a controlled current sharing and current balancing techniques achieved by utilizing the parallel-connected voltage regulators with the phase controller.

8. Claims 8, 18 and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qian (USP 6,512,352) in view of Dwelley et al. (USP 6,166,527). Qian discloses the claimed invention except for the on-time conduction controller with multi-level gate driver circuit. Dwelley discloses that it is known in the art to provide the on-time conduction controller with multi-level gate driver circuit. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to

provide with the controlled inductive switching circuit of Qian with the on-time conduction controller with multi-level gate driver circuit of Dwelley, in order to provide a controlled switching scheme that conserves power by driving less than all the switches when the input voltage is higher or lower than the output voltage.

Response to Arguments

9. Applicant's arguments filed 6-15-05 have been fully considered but they are not persuasive. In response to applicant's argument that the prior art "Qian does not show, teach or suggest a voltage regulator including first and second windings having a coefficient of coupling approximately equal to one." This is an inherent feature of the most basic principle of all transformer design. See the Stratton reference column lines 35-40. "In normal transformer design, the coefficient of coupling K is kept as close to unity as possible, a value of 0.998 being common. Departure from unity arises due to magnetic flux from the primary winding following a path through non-magnetic winding insulation or air gaps that does not link with the secondary winding (and vice-versa)."

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bao Q. Vu whose telephone number is (571) 272-2088. The examiner can normally be reached on Monday-Fridays, 8:00AM- 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Sherry can be reached on (571) 272-2084. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Bao Q. Vu
Primary Examiner
Art Unit 2838

August 9, 2005